

## Inventory of Irrigation Infrastructure in Montana

*pph. 2820*  
*Alicia Stanley*

The 2007 legislature directed the DNRC to conduct an inventory of irrigation infrastructure in Montana. The Long Range Planning Committee approved an appropriation of \$100,000 in HB-6 to conduct the study and produce a comprehensive irrigation report. 1/20/08  
LRP  
Committee

EXHIBIT 14  
DATE Jan 20, 09

I'll take a few minutes this morning to describe the study and summarize results. I have enough copies of this report for all committee members, please let me know if you'd like one or if you prefer a compact disk. Or both.

### **Purpose**

The purpose of the study was to provide decision makers with an understanding of the condition of irrigation systems throughout Montana and the estimated cost of completing necessary improvements.

### **Who**

We hired a consulting company in Montana that specializes in irrigation projects, PBS&J. I am pleased to report that they have done a great job and met the purpose of the study with this final report. They also developed a GIS database that I hope the public will find useful as an interactive map on the DNRC website.

*also*  
I was fortunate enough to be able to recruit two experts in Montana irrigation to help me with project design and oversight. Pat Riley is on my staff in the Billings office and very capably manages the Irrigation Development Program. Bill Greiman is the agricultural engineer on staff with the Reserved Water Rights Compact Commission. Both seem to know every system and who controls the headgates in every part of Montana.

Both have passed on to me an enormous appreciation for Montana's agricultural community, as did our contractor, PBS&J. I would like to share a little of what they have taught me as background to this study.

## **Background**

Irrigation structures have been constructed in Montana since the mid 1850's. While some large projects were built in those early years (projects such as the Mammoth Ditch in the Gallatin Valley and the Big Ditch or M&M Canal near Billings), for the most part, irrigation in Montana developed on the basis of individual or small group initiatives until the turn of the century. At that time, the federal government became involved and projects such as the Milk River Project, the Lower Yellowstone Project and the Huntley Project were authorized by the U.S. Bureau of Reclamation.

Many additional federal projects were built during the drought years between 1917 and 1939. In the 1930's Montana created the State Water Conservation Board to manage state and federal money for small irrigation projects. By 1952, the State Water Conservation Board had built 173 projects throughout the state.

The State, now through DNRC's Water Projects Bureau, still maintains an interest in and responsibility for several of these structures. But for the most part, ownership of the structures and systems were turned over to the water users. Most of the irrigation systems in operation today rely on infrastructure from this period and before. And if you do the math, that makes them between 55 and 100 years old.

## **Why**

In the last few legislative sessions, the staff of the RDB has seen increasingly more grant applications for increasingly larger projects having to do with the repair of aging irrigation infrastructure. This study is meant to answer the question: is Montana's irrigation infrastructure in trouble and how much will it cost to fix it?

## **Methods**

To collect the data for this report, PBS&J interviewed the staff of federal and state agencies, conducted a mail survey sent to about 230 irrigation systems, and conducted 10 on-site evaluations of systems across Montana. Detailed results of the survey and on-site evaluations are provided in this report.

The mail survey had a 35% response rate. PBS&J extrapolated from data collected from the mail survey and on-site evaluations to arrive at some of the conclusions in this report.

## **Study Results**

In the interest of time and to keep tedium to a minimum, I am going to recite just a few of their more interesting findings.

## **Condition**

The study divided irrigation infrastructure components into 3 categories: diversion structures, conveyance facilities and storage facilities. Extrapolating from survey and on-site data, PBS&J estimated the following needs:

- Approximately 194 diversion structures statewide are in need of repair
- About 152 conveyance facilities such as siphons and flumes are impaired
- Many dams need small repairs or rehabilitation such as the Fred Burr Reservoir, a relatively small facility, that will need about \$2 million for repairs.

This investigation indicates that there is not "typical" irrigation system in Montana. The study was unable to identify trends for system-types that needed more repair than others. Age was not a common factor, nor was location in the state, or size.

The common thread among the various systems across the state is that irrigation systems are subject to many natural and human-caused forces. These forces result in the need for regular, and sometimes constant, maintenance to sustain normal function. The ability of a system operator to provide adequate maintenance and fix problems as they arise seem to influence which systems were in the greatest need of repair.

*The Report also found that*

The majority of the facilities managed by the Bureau and DNRC are in fair to good condition. The Bureau's Milk River Project is the major exception. Other projects such as the Bitter Root project have one or two major issues but the remainder of the systems are in fair to good condition overall. However these major problems will be costly: The cost of repairs on the Milk River Project will likely exceed \$150 million. A needed siphon replacement on the Bitter Root project will cost more than \$6 million.

These large government related systems, including BIA, account for about 60% of irrigated acreage in the State. About 40% of irrigated acreage is served by private systems.

**Costs** *Estimates for these needed repairs are as follows:*

- The State has invested over \$90 million rehabilitating ~~the~~ DRNC dams and canals over the past 20 years, and estimate that about \$51 million will be needed over the next decade to bring all of the facilities into good working order.
- The U.S. Bureau of ~~Reclamation~~ estimates a need for \$160 million of repair on its ~~systems~~, and
- based on the results of the mail survey, PBS&J extrapolated an estimated cost of \$132 million to repair other systems across the state.

general need of ~~\$343 million~~ statewide.

As you can imagine, the costs for fixing the problems on some systems are much higher than what the water users can afford to pay.

The obvious question is: with inevitable decline of our aging irrigation infrastructure and finite resources to pay for repairs, how might we prioritize projects for funding? Some suggestions are to base it on

- Need: which system can least pay for their repairs, or on
- Size: which system serves the most acres, or
- Crop value: which system produces the greatest revenues
- External values: which system also supports domestic wells, or in the case of the St. Mary's diversion that supports the entire Milk River ecosystem.

Observation - systems affect > agricultural economy -  
**Economic Study**

In closing, I want to mention that there is a companion report to this infrastructure study. The 2007 legislature also directed DNRC, in House Bill 2, to evaluate the economic value of investing in irrigation. I presented the results of that study to the Water Policy Interim Committee in Sept. and would be happy to provide copies (hard copies or in CD) of that study if interested.

Encroaching subdivision development  
Recharge ~~water~~ Domestic water wells  
Wellheads